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THE ROCKEFELLER INSTITUTE  
FOR MEDICAL RESEARCH

DEPARTMENT OF ANIMAL AND PLANT PATHOLOGY  
PRINCETON, NEW JERSEY

May 7, 1936.

Dr. Michael Heidelberger,  
The Rockefeller Institute for Medical Research,  
66th Street and York Avenue,  
New York, N. Y.

Dear Dr. Heidelberger:

In my study of the neutralization of plant viruses by immune serum, I have regularly found that, although it is comparatively easy to neutralize most of the virus in a given sample of juice, it is very difficult or impossible to neutralize so completely that no unneutralized virus whatever can be demonstrated (our methods for detecting small quantities of virus are highly sensitive). In this respect, the neutralization of plant viruses by serum appears to be governed by a mass action relationship such as one sees in the neutralization of tetanolyisin by its antitoxin.

This situation in plant virus neutralization appears very analogous to your findings with the precipitin reaction in which the most careful titrations show presence of small amounts of antibody and antigen in neutral mixtures, as in the dissociation of certain salts. A question which has arisen concerns the problem of whether a small amount of dissociation regularly occurs in what are customarily considered neutral mixtures of antigen and antibody. Since you have been interested in this phase of serology, I wonder if you could direct me to references in the literature which handle this problem critically.

You may recall that when you visited Princeton I told you of a method which has recently been worked out for recovering large quantities of virus from neutral antibody-virus precipitates. At that time you regretted that the methods did not permit the reciprocal type of experiment, recovery of antibodies from such precipitates. Recent experiments have indicated that this latter is possible with certain of the plant viruses. One of the potato viruses, for example, is highly susceptible to acid, while its antibody is relatively resistant. If washed precipitate from this virus and its antibody is acidified, the virus undergoes dissolution and virtually 100% of the antibodies are recoverable in relatively pure state.

Very sincerely yours,

*K. Starr Chester*

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*Answered from  
Uppsala*

KSC:MS